

Assignment Sheet / Density Test

Project Number: 23502-ZS9Lab. Tech: K. FordProject Name: HSRDate Completed: 11/26/13Date Drilled: 10/30/13Boring: 50068R

Sample	Depth	Tests	Soil Wt	Length	Diameter	Wet Wt	Dry Wt	Wet	Moisture	Dry	Soil
			Gms	in	in	Gms	Gms	Density	%	Density	Classification
D 04	0.51	01101101101				000	407.0		0.407		
B01	0-5'	CURV,RV,SA	1			200	187.9		6.4%		SM
SS03	11-11.5'	HY,SA							44.50/		ML
SS07	31-31.5'	SA				200	179.9		11.2%		SP
SS11	51-51.5'	HY,SA									ML
MC12-2		DD,SA	953.0	6.02	2.42	200	170.4	131.2	17.4%	111.7	SP/SM
SS13	61-61.5'	DD,PI				30	24.7		21.5%		ML
MC14-2	65.5-66'	TRX									
SS16	71-71.5'	DD,PI				30	26.4		13.6%		CL
MC17-2	75.5-76	DD				200	161.6		23.8%		CL-SP/SM
SS18	81-81.5	HY,SA									ML
MC23-1	105.5-106'	DD,PI	915.1	6.02	2.42	200	159.6	125.9	25.3%	100.5	SP
SS24	111-111.5'	HY,SA									SC
MC29-2	135.5-136'	DD,SA	888.7	5.80	2.42	200	159.7	126.9	25.2%	101.4	ML
SS30	141-141.5'	DD,PI				50	42.4		17.9%		ML
MC31-1	146-146.5'	DD,HY,SA	992.7	6.02		200	173.1	98.8	15.5%	85.6	ML
			1								
			1								
			+ +								
			1								

Notes:

CHEM Sulfate/Chloride MR Minimum Resistivity
COLL Collapse PH pH Test

CONSOL 1D Consolidation PI Atterberg Limits

CURV Modified Proctor RV R-value

DD Moisture Density RVT R-value Treated
DS Direct Shear SA Sieve Analysis
HY Hydrometer TRX Triaxial Compression



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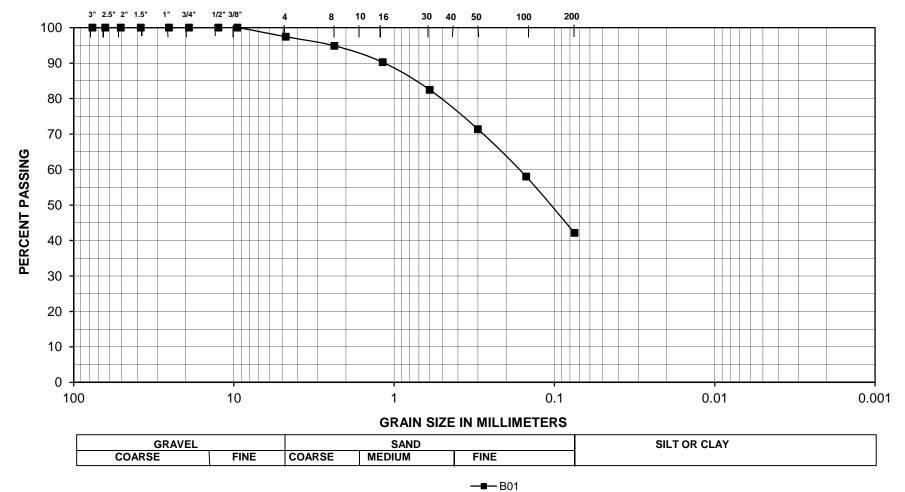
Sieve Analysis for Soil / Fine Aggregate ASTM C-136

Project:	CA HSR		Technician:	K. Ford	
r roject.	CATION		Date:	11/24/2013	
TES#:	23502-ZS9		Sample No.:	B01	
Boring #:	S0068R; 0-5'		Classification:	(SM) Silty Sand	
209			_	(Giri) Giriy Garria	
		Weight	Maximum	Minimum W	Veight of
	l	(lbs. or grams)	Sieve Size	Test Specime	
Total Dry S	Sample + Tare Wt.	,	Sand	1.0 (0	` •
Tare Weigl			3/8"	2.0 (1	
	Sample Wt.	187.9	1/2"	4.0 (2	
Initial Weig			3/4"	11.0 (5	
_	Before Wash	187.9	1"	22.0 (1	
Final Weig	ht Fine		1 1/2"	33.0 (1	5.0)
Aggregate	After Wash	112.6	2"	44.0 (2	0.0)
	Cumulative	Individual	Cumulative	Cumulative	
Sieve	Weight	Weights	%	%	
Size	Retained	Retained	Retained	Passing	Specs.
3 in.			0.0	100.0	
2 1/2 in.			0.0	100.0	
2 in.			0.0	100.0	
1 1/2 in.			0.0	100.0	
1 in.			0.0	100.0	
3/4 in.			0.0	100.0	
1/2 in.			0.0	100.0	
3/8 in.			0.0	100.0	
#4	4.8	0.0	2.6	97.4	
#8	9.6	4.8	5.1	94.9	
#16	18.3	8.7	9.7	90.3	
#30	32.9	14.6	17.5	82.5	
#50	53.8	20.9	28.6	71.4	
#100	78.9	25.1	42.0	58.0	
#200	108.7	29.8	57.8	42.2	

112.6

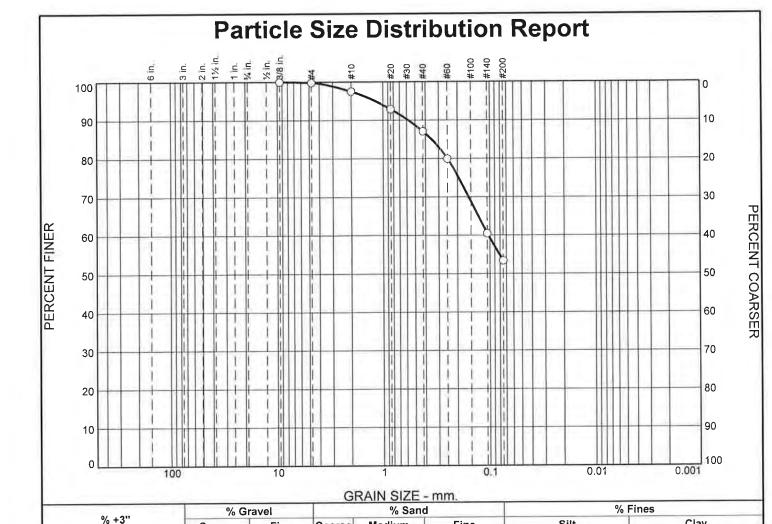
Pan

U.S. STANDARD SIEVE NUMBERS



_	-	BC

Sample #	Classification	% Gravel	% Sand	% Silt	% Clay	% Moist.	LL	PL	PI	Project:	CA HSR
B01	(SM) Silty Sand	2.6	55.3	42.2							
										TES#:	23502-ZS9
										Boring #	S0068R; 0-5'
										Date:	11/24/2013



SIEVE	PERCENT	SPEC.*	PASS?
SIZE	FINER	PERCENT	(X=NO)
3/8	100		
#4	100		
#10	97		
#20	93		
#40	87		
#60	80		
#140	60		
#200	53		
	1		

Coarse

Fine

Coarse

Medium 10

	Soil Description	
Olive gray sand	y silt	
PL=	Atterberg Limits LL=	PI=
D ₉₀ = 0.5776 D ₅₀ = D ₁₀ =	Coefficients D ₈₅ = 0.3499 D ₃₀ = C _u =	D ₆₀ = 0.1037 D ₁₅ = C _c =
USCS=	Classification AASHT	0=
F.M.=0.65	Remarks	

Silt

* (no specification provided)

0

Source of Sample: S0068R G-52771 Sample Number: MC02-1

Depth: 6.0-6.5

Date:

Clay

53



Client: URS/ARUP/HMM JV

Project: California High Speed Train

Fine

34

Project No: 2636-001.0

Figure



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Sieve Analysis for Soil and Fine Aggregate

 Project:
 CA HSR FRE_BAK
 Technician:
 K. Ford

 TES#:
 23502-ZS9
 Date:
 9/20/2013

 Boring No.:
 S0068R
 Depth, ft
 11-11.5

 Sample No.:
 SS03
 Classification:
 (SM/ML) Sandy Clayey Silt

	Weight	Maximum Sieve Size	Minimum Weight of
	(grams)		Test Specimen, lbs. (kg)
Total Dry Sample + Tare Wt.		Sand	1.0 (0.5)
Tare Weight		3/8"	2.0 (1.0)
Total Dry Sample Wt.	73.5	1/2"	4.0 (2.0)
Initial Weight Fine		3/4"	11.0 (5.0)
Soil Before Wash	73.5	1"	22.0 (10.0)
Final Weight Fine		1 1/2"	33.0 (15.0)
Soil After Wash	35.4	2"	44.0 (20.0)

0.	Individual	Individual	Combined	Combined	
Sieve	Weight	%	%	%	
Size	Retained	Retained	Retained	Passing	Specs.
3 in.	0.0	0.0	0.0	100.0	
2 1/2 in.	0.0	0.0	0.0	100.0	
2 in.	0.0	0.0	0.0	100.0	
1 1/2 in.	0.0	0.0	0.0	100.0	
1 in.	0.0	0.0	0.0	100.0	
3/4 in.	0.0	0.0	0.0	100.0	
1/2 in.	0.0	0.0	0.0	100.0	
3/8 in.	0.0	0.0	0.0	100.0	
#4	0.0	0.0	0.0	100.0	
#8	0.7	1.0	1.0	99.0	
#10	0.6	0.8	1.8	98.2	
#16	0.2	0.3	2.0	92.0	
#30	11.6	15.8	17.8	82.5	
#40	4.2	5.7	23.5	76.9	
#50	5.7	7.8	31.3	69.2	
#100	7.0	9.5	40.8	59.9	
#200	5.9	8.0	48.8	52.0	
Pan					

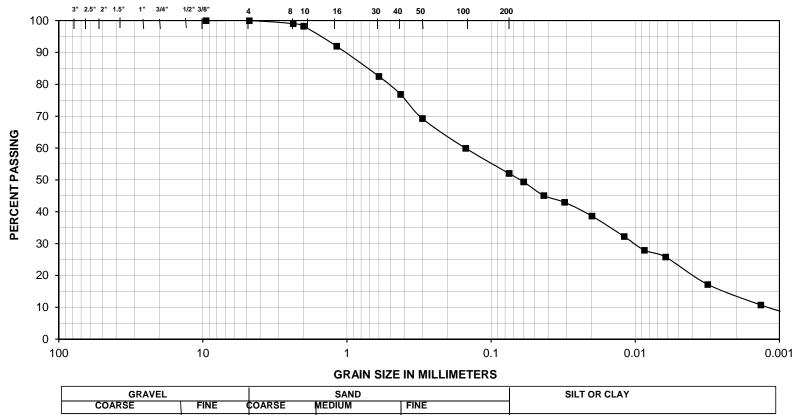


HYDROMETER TEST DATA SUMMARY ASTM D 422-63

PROJECT:		CA HSR F	RE_BAK			TES # :	S0068R
Boring Number		S000	68R			DATE:	9/20/2013
Sample Depth	, ft	11-1	1.5	Sample No.:	SS03	TESTED BY: K. Ford	
Mass of Test S	Sample, g		75.00	"air-dried"	ך	Hydrometer Type	151H
	scopic Sample, g		16.98	"air-dried"	1		
Mass of Hygro	scopic Sample, g		16.65	"oven-dried"	Specific Gravity	of Test Material	2.650
Mass of Test S	Sample, g		73.54	"oven-dried"	Specific Gravity	of Test Solution	Varies
Time	Lludromotor	Corrected	Tomporeture	Effective Depth	Constant V	Diameter D	Amt Cuppended D
Time (min.)	Hydrometer Reading	Corrected Reading	Temperature Degrees C	Effective Depth Table 2 (cm)	Constant, K Table 3	Diameter, D (mm)	Amt. Suspended, P (%)
0.5	1.024	1.023	23	10.2	0.01317	0.0595	50.3
1	1.022	1.021	23	10.7	0.01317	0.0431	45.9
2	1.021	1.020	23	11.0	0.01317	0.0309	43.7
5	1.019	1.018	23	11.5	0.01317	0.0200	39.3
15	1.016	1.015	23	12.3	0.01317	0.0119	32.8
30	1.014	1.013	23	12.9	0.01317	0.0086	28.4
60	1.013	1.012	23	13.1	0.01317	0.0062	26.2
250	1.009	1.008	23	14.2	0.01317	0.0031	17.5
1440	1.006	1.005	23	15.0	0.01317	0.0013	10.9
2880	1.005	1.004	23	15.2	0.01317	0.0010	8.7



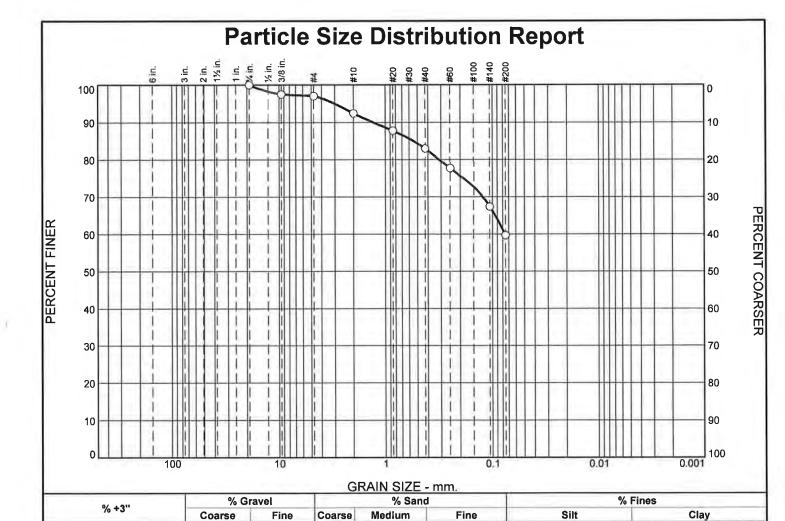
U.S. STANDARD SIEVE NUMBERS



 1	1-	1	15	

Sample #	Classification	% Gravel	% Sand	% Silt	% Clay*	% Moist.	LL	PL	PI	Project:	CA HSR FRE_BAK
SS03	(SM/ML) Sandy Clayey Silt	0	48.8	27.5	23.7	2.0					
										TES#:	23502-ZS9
										Boring#:	S0068R 11-11.5'
										Date:	9/20/2013

^{*} Particles smaller than 5 Micron in diameter



SIEVE SIZE	PERCENT	SPEC.* PERCENT	PASS? (X=NO)
3/4	100		(1111)
3/8	97		
#4	97		
#10	92		
#20	88		
#40	83		
#60	78		
#140	67		
#200	60		
	1		
		10	

0

Olive gray sandy	Soil Description	
	•	
PL=	Atterberg Limits LL=	PI=
D ₉₀ = 1.2893 D ₅₀ = D ₁₀ =	Coefficients D ₈₅ = 0.5458 D ₃₀ = C _u =	D ₆₀ = 0.0759 D ₁₅ = C _c =
USCS=	Classification AASHT	O=
F.M.=0.85	Remarks	
	, , , , , ,	O=

* (no specification provided)

0

Source of Sample: S0068R G-52771 **Sample Number:** MC04-2

Depth: 15.5-16

5

Date: 11/18/13



Client: URS/ARUP/HMM JV

Project: California High Speed Train

Project No: 2636-001.0

Figure

Tested By: SB

Checked By: PH



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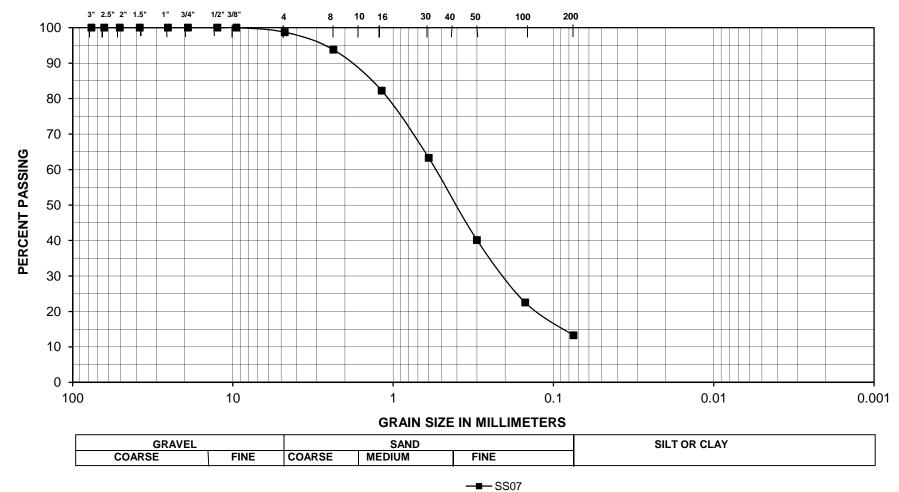
Sieve Analysis for Soil / Fine Aggregate ASTM C-136

Project:	CA HSR	Technician:	K. Ford
		Date:	11/24/2013
TES#:	23502-ZS9	Sample No.:	SS07
Boring #:	S0068R; 31-31.5'	Classification:	(SP) Fine Silty Sand
			-
	1		T

!			
	Weight	Maximum	Minimum Weight of
	(lbs. or grams)	Sieve Size	Test Specimen, lbs. (kg)
Total Dry Sample + Tare Wt.		Sand	1.0 (0.5)
Tare Weight		3/8"	2.0 (1.0)
Total Dry Sample Wt.	179.9	1/2"	4.0 (2.0)
Initial Weight Fine		3/4"	11.0 (5.0)
Aggregate Before Wash	179.9	1"	22.0 (10.0)
Final Weight Fine		1 1/2"	33.0 (15.0)
Aggregate After Wash	157.3	2"	44.0 (20.0)

	Cumulative	Individual	Cumulative	Cumulative	
Sieve	Weight	Weights %		%	
Size	Retained	Retained	Retained	Passing	Specs.
3 in.			0.0	100.0	
2 1/2 in.			0.0	100.0	
2 in.			0.0	100.0	
1 1/2 in.			0.0	100.0	
1 in.			0.0	100.0	
3/4 in.			0.0	100.0	
1/2 in.			0.0	100.0	
3/8 in.			0.0	100.0	
#4	2.3	0.0	1.3	98.7	
#8	11.2	8.9	6.2	93.8	
#16	31.9	20.7	17.7	82.3	
#30	66.0	34.1	36.7	63.3	
#50	107.7	41.7	59.9	40.1	
#100	139.4	31.7	77.5	22.5	
#200	156.0	16.6	86.7	13.3	
Pan	157.3				

U.S. STANDARD SIEVE NUMBERS



		c	c	0
	_	J	J	u

Sample #	Classification	% Gravel	% Sand	% Silt	% Clay	% Moist.	LL	PL	PI	Project:	CA HSR
SS07	(SP) Fine Silty Sand	1.3	85.4	13.3							
										TES#:	23502-ZS9
										Boring #	S0068R; 31-31.5'
										Date:	11/24/2013



Construction Testing & Inspection * Geotechnical & Environmental Engineering

Sieve Analysis for Soil and Fine Aggregate

 Project:
 CA HSR FRE_BAK
 Technician:
 K. Ford

 TES#:
 23502-ZS9
 Date:
 11/12/2013

 Boring No.:
 S0068R
 Depth, ft
 51-51.5'

 Sample No.:
 SS11
 Classification:
 (SM/ML) Sandy Clayey Silt

	Weight	Maximum	Minimum Weight of
	(grams)	Sieve Size	Test Specimen, lbs. (kg)
Total Dry Sample + Tare Wt.		Sand	1.0 (0.5)
Tare Weight		3/8"	2.0 (1.0)
Total Dry Sample Wt.	73.0	1/2"	4.0 (2.0)
Initial Weight Fine		3/4"	11.0 (5.0)
Soil Before Wash	73.0	1"	22.0 (10.0)
Final Weight Fine		1 1/2"	33.0 (15.0)
Soil After Wash	35.7	2"	44.0 (20.0)

	Individual	Individual Combined		Combined	
Sieve	Weight	%	%	%	
Size	Retained	Retained	Retained	Passing	Specs.
3 in.	0.0	0.0	0.0	100.0	
2 1/2 in.	0.0	0.0	0.0	100.0	
2 in.	0.0	0.0	0.0	100.0	
1 1/2 in.	0.0	0.0	0.0	100.0	
1 in.	0.0	0.0	0.0	100.0	
3/4 in.	0.0	0.0	0.0	100.0	
1/2 in.	0.0	0.0	0.0	100.0	
3/8 in.	0.0	0.0	0.0	100.0	
#4	0.0	0.0	0.0	100.0	
#8	0.0	0.0	0.0	100.0	
#10	0.0	0.0	0.0	100.0	
#16	0.2	0.3	0.3	99.5	
#30	3.5	4.8	5.1	94.9	
#40	3.2	4.4	9.4	90.6	
#50	4.8	6.6	16.0	84.0	
#100	10.5	14.4	30.4	69.6	
#200	11.7	16.0	46.4	53.6	
Pan					

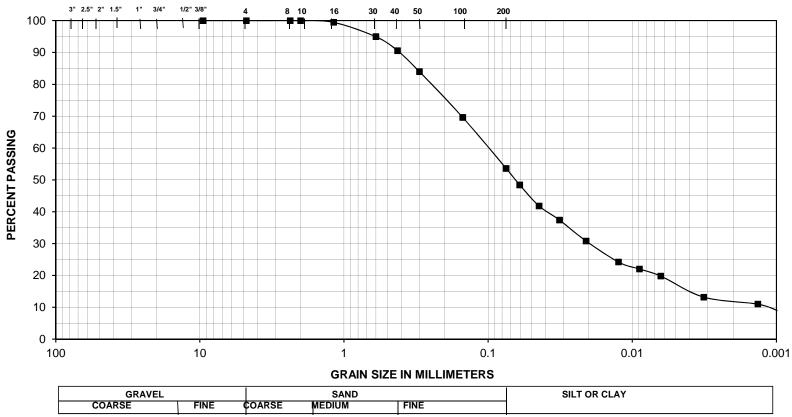


HYDROMETER TEST DATA SUMMARY ASTM D 422-63

PROJECT:		CA HSR F	RE_BAK			TES#:	S0068R	
Boring Number		S006	68R	_		DATE: 11/12/2013		
Sample Depth	mple Depth, ft51-51.5'		1.5'	Sample No.:	SS11	TESTED BY:	K. Ford	
			1		7			
Mass of Test S			75.00	"air-dried"	_	Hydrometer Type	151H	
, ,	scopic Sample, g		21.83	"air-dried"				
Mass of Hygro	scopic Sample, g		21.26	"oven-dried"	Specific Gravity of	of Test Material	2.650	
Mass of Test S	Sample, g		73.04	"oven-dried"	Specific Gravity of	of Test Solution	Varies	
Time	Hydrometer	Corrected	Temperature	Effective Depth	Constant, K	Diameter, D	Amt. Suspended, P	
(min.)	Reading	Reading	Degrees C	Table 2 (cm)	Table 3	(mm)	(%)	
0.5	1.023	1.022	23	10.5	0.01317	0.0604	48.4	
1	1.020	1.019	23	11.3	0.01317	0.0443	41.8	
2	1.018	1.017	23	11.8	0.01317	0.0320	37.4	
5	1.015	1.014	23	12.6	0.01317	0.0209	30.8	
15	1.012	1.011	23	13.4	0.01317	0.0124	24.2	
30	1.011	1.010	23	13.7	0.01317	0.0089	22.0	
60	1.010	1.009	23	13.9	0.01317	0.0063	19.8	
250	1.007	1.006	23	14.7	0.01317	0.0032	13.2	
1440	1.006	1.005	23	15.0	0.01317	0.0013	11.0	
2880	1.005	1.004	23	15.2	0.01317	0.0010	8.8	



U.S. STANDARD SIEVE NUMBERS



Sample #	Classification	% Gravel	% Sand	% Silt	% Clay*	% Moist.	LL	PL	PΙ	Project:	CA HSR FRE_BAK
SS11	(SM/ML) Sandy Clayey Silt	0	46.4	35.8	17.8	2.7					
										TES#:	23502-ZS9
										Boring#:	S0068R 51-51.5'
										Date:	11/12/2013

^{*} Particles smaller than 5 Micron in diameter



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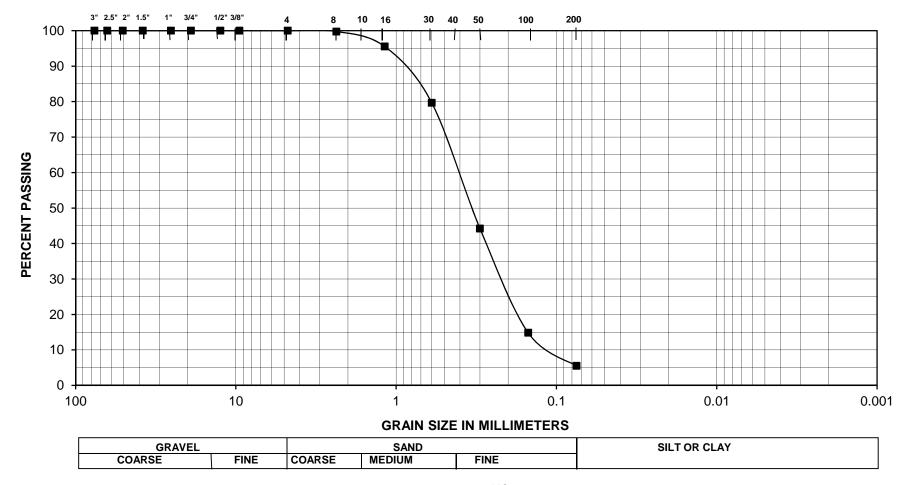
Sieve Analysis for Soil / Fine Aggregate ASTM C-136

Project:	CA HSR		Technician:	K. Ford
Project.	CATION		_ recrimician. Date:	11/24/2013
TES#:	23502-ZS9		Sample No.:	MC12-2
Boring #:	S0068R; 55.5-56'		Classification:	(SP) Fine Silty Sand
		Weight	Maximum	Minimum Weight of
(lbs. or gra		(lbs. or grams)	Sieve Size	Test Specimen, lbs. (kg)
Total Dry S	Sample + Tare Wt.		Sand	1.0 (0.5)
Tare Weight			3/8"	2 0 (1 0)

	(lbs. or grams)	Sieve Size	Test Specimen, lbs. (kg)
Total Dry Sample + Tare Wt.		Sand	1.0 (0.5)
Tare Weight		3/8"	2.0 (1.0)
Total Dry Sample Wt.	170.4	1/2"	4.0 (2.0)
Initial Weight Fine		3/4"	11.0 (5.0)
Aggregate Before Wash	170.4	1"	22.0 (10.0)
Final Weight Fine		1 1/2"	33.0 (15.0)
Aggregate After Wash	161.4	2"	44.0 (20.0)

	0 1 (1 12 2 1 1	0 10	0 1 "	
	Cumulative	Individual	Cumulative	Cumulative	
Sieve	Weight	Weights	%	%	
Size	Retained	Retained	Retained	Passing	Specs.
3 in.			0.0	100.0	
2 1/2 in.			0.0	100.0	
2 in.			0.0	100.0	
1 1/2 in.			0.0	100.0	
1 in.			0.0	100.0	
3/4 in.			0.0	100.0	
1/2 in.			0.0	100.0	
3/8 in.	·		0.0	100.0	·
#4	0.0	0.0	0.0	100.0	
#8	0.4	0.4	0.2	99.8	
#16	7.6	7.2	4.5	95.5	
#30	34.6	27.0	20.3	79.7	
#50	95.0	60.4	55.8	44.2	
#100	145.1	50.1	85.2	14.8	
#200	161.0	15.9	94.5	5.5	
Pan	161.4				

U.S. STANDARD SIEVE NUMBERS



—**■**— MC12-2

Sample #	Classification	% Gravel	% Sand	% Silt	% Clay	% Moist.	LL	PL	PI	Project:	CA HSR
MC12-2	(SP) Fine Silty Sand	0	94.5	5.5							
										TES#:	23502-ZS9
										Boring #	S0068R; 55.5-56'
										Date:	11/24/2013



Construction Testing & Inspection * Geotechnical & Environmental Engineering

Sieve Analysis for Soil and Fine Aggregate

 Project:
 CA HSR FRE_BAK
 Technician:
 K. Ford

 TES#:
 23502-ZS9
 Date:
 11/12/2013

 Boring No.:
 S0068R
 Depth, ft
 81-81.5'

 Sample No.:
 SS18
 Classification:
 (SM/ML) Silty Clayey Sand

	Weight (grams)	Maximum Sieve Size	Minimum Weight of Test Specimen, lbs. (kg)
T	(grains)		1
Total Dry Sample + Tare Wt.		Sand	1.0 (0.5)
Tare Weight		3/8"	2.0 (1.0)
Total Dry Sample Wt.	73.7	1/2"	4.0 (2.0)
Initial Weight Fine		3/4"	11.0 (5.0)
Soil Before Wash	73.7	1"	22.0 (10.0)
Final Weight Fine		1 1/2"	33.0 (15.0)
Soil After Wash	44.0	2"	44.0 (20.0)

	Individual	Individual	Combined	Combined	
Sieve	Weight	%	%	%	
Size	Retained	Retained	Retained	Passing	Specs.
3 in.	0.0	0.0	0.0	100.0	
2 1/2 in.	0.0	0.0	0.0	100.0	
2 in.	0.0	0.0	0.0	100.0	
1 1/2 in.	0.0	0.0	0.0	100.0	
1 in.	0.0	0.0	0.0	100.0	
3/4 in.	0.0	0.0	0.0	100.0	
1/2 in.	0.0	0.0	0.0	100.0	
3/8 in.	0.0	0.0	0.0	100.0	
#4	0.0	0.0	0.0	100.0	
#8	0.0	0.0	0.0	100.0	
#10	0.0	0.0	0.0	100.0	
#16	0.2	0.3	0.3	99.9	
#30	0.1	0.1	0.4	99.6	
#40	0.4	0.5	0.9	99.1	
#50	0.9	1.2	2.2	97.8	
#100	5.4	7.3	9.5	90.5	
#200	32.1	43.6	53.1	46.9	_
Pan					

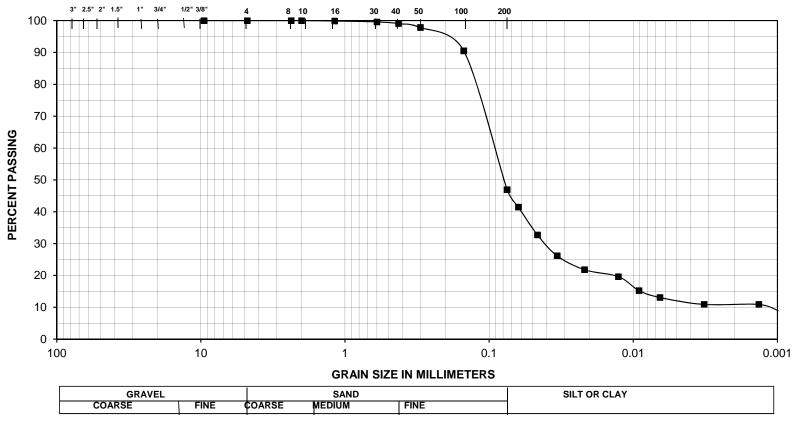


HYDROMETER TEST DATA SUMMARY ASTM D 422-63

PROJECT:		CA HSR F	RE_BAK			TES#:	S0068R
Boring Number		S006	68R			DATE:	11/12/2013
Sample Depth	, ft	81-8	1.5'	Sample No.:	SS18	TESTED BY:	K. Ford
					7		
Mass of Test S			75.00	"air-dried"		Hydrometer Type	151H
	scopic Sample, g		22.37	"air-dried"			
Mass of Hygro	scopic Sample, g		21.98	"oven-dried"	Specific Gravity of	of Test Material	2.650
Mass of Test S	Sample, g		73.69	"oven-dried"	Specific Gravity of	of Test Solution	Varies
Time	Hydrometer	Corrected	Temperature	Effective Depth	Constant, K	Diameter, D	Amt. Suspended, P
(min.)	Reading	Reading	Degrees C	Table 2 (cm)	Table 3	(mm)	(%)
0.5	1.020	1.019	23	11.3	0.01317	0.0626	41.4
1	1.016	1.015	23	12.3	0.01317	0.0462	32.7
2	1.013	1.012	23	13.1	0.01317	0.0337	26.2
5	1.011	1.010	23	13.7	0.01317	0.0218	21.8
15	1.010	1.009	23	13.9	0.01317	0.0127	19.6
30	1.008	1.007	23	14.4	0.01317	0.0091	15.3
60	1.007	1.006	23	14.7	0.01317	0.0065	13.1
250	1.006	1.005	23	15.0	0.01317	0.0032	10.9
1440	1.006	1.005	23	15.0	0.01317	0.0013	10.9
2880	1.005	1.004	23	15.2	0.01317	0.0010	8.7



U.S. STANDARD SIEVE NUMBERS



	01	-81	6
_	OI	-01	٠.

Sample #	Classification	% Gravel	% Sand	% Silt	% Clay*	% Moist.	LL	PL	ΡI	Project:	CA HSR FRE_BAK
SS18	(SM/ML) Silty Clayey Sand	0	53.1	34.3	12.6	1.8					
										TES#:	23502-ZS9
										Boring#:	S0068R 81-51.5'
										Date:	11/12/2013

^{*} Particles smaller than 5 Micron in diameter



Construction Testing & Inspection * Geotechnical & Environmental Engineering

Sieve Analysis for Soil and Fine Aggregate

 Project:
 CA HSR FRE_BAK
 Technician:
 K. Ford

 TES#:
 23502-ZS9
 Date:
 11/12/2013

 Boring No.:
 S0068R
 Depth, ft
 111-111.5'

 Sample No.:
 SS24
 Classification:
 (SC) Clayey Sand

	Weight (grams)	Maximum Sieve Size	Minimum Weight of Test Specimen, lbs. (kg)
Total Dry Sample + Tare Wt.	, σ	Sand	1.0 (0.5)
Tare Weight		3/8"	2.0 (1.0)
Total Dry Sample Wt.	99.1	1/2"	4.0 (2.0)
Initial Weight Fine		3/4"	11.0 (5.0)
Soil Before Wash	99.1	1"	22.0 (10.0)
Final Weight Fine		1 1/2"	33.0 (15.0)
Soil After Wash	79.3	2"	44.0 (20.0)

	Individual	Individual	Combined	Combined	
Sieve	Weight	%	%	%	
Size	Retained	Retained	Retained	Passing	Specs.
3 in.	0.0	0.0	0.0	100.0	
2 1/2 in.	0.0	0.0	0.0	100.0	
2 in.	0.0	0.0	0.0	100.0	
1 1/2 in.	0.0	0.0	0.0	100.0	
1 in.	0.0	0.0	0.0	100.0	
3/4 in.	0.0	0.0	0.0	100.0	
1/2 in.	0.0	0.0	0.0	100.0	
3/8 in.	0.0	0.0	0.0	100.0	
#4	0.0	0.0	0.0	100.0	
#8	1.4	1.4	1.4	98.6	
#10	0.8	0.8	2.2	97.8	
#16	0.2	0.2	2.4	91.7	
#30	15.9	16.0	18.5	81.9	
#40	8.6	8.7	27.1	73.4	
#50	6.8	6.9	34.0	66.7	
#100	14.4	14.5	48.5	52.5	
#200	30.5	30.8	79.3	22.4	
Pan					

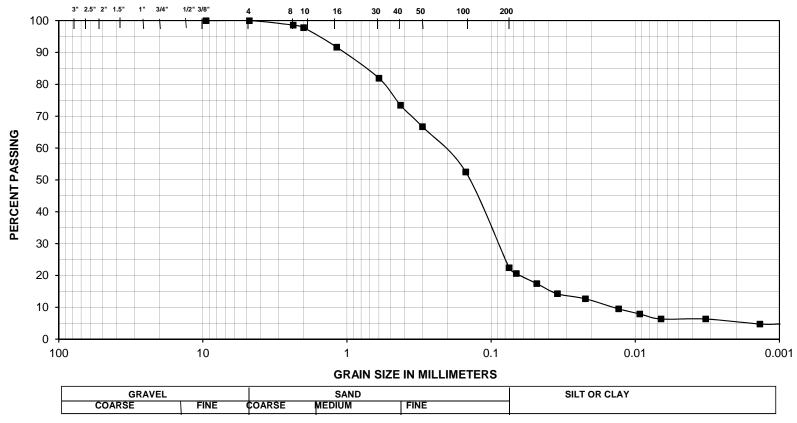


HYDROMETER TEST DATA SUMMARY ASTM D 422-63

PROJECT:		CA HSR F	RE_BAK	TES # :	TES # : S0068R		
Boring Number		S006	68R	_		DATE:	11/12/2013
Sample Depth	, ft	111-1	11.5'	Sample No.:	SS24	TESTED BY:	K. Ford
Mass of Test S	Sample, g		100.00	"air-dried"	7	Hydrometer Type	151H
	scopic Sample, g		19.71	"air-dried"		, ,,	
	scopic Sample, g		19.54	"oven-dried"	Specific Gravity of	of Test Material	2.650
Mass of Test S	Sample, g		99.14	"oven-dried"	Specific Gravity of	of Test Solution	Varies
	T	T	T =	T =# 11 = 11	<u> </u>		
Time	Hydrometer	Corrected	Temperature	Effective Depth	Constant, K	Diameter, D	Amt. Suspended, P
(min.)	Reading	Reading	Degrees C	Table 2 (cm)	Table 3	(mm)	(%)
0.5	1.014	1.013	23	12.9	0.01317	0.0669	21.1
1	1.012	1.011	23	13.4	0.01317	0.0482	17.8
2	1.010	1.009	23	13.9	0.01317	0.0347	14.6
5	1.009	1.008	23	14.2	0.01317	0.0222	13.0
15	1.007	1.006	23	14.7	0.01317	0.0130	9.7
30	1.006	1.005	23	15.0	0.01317	0.0093	8.1
60	1.005	1.004	23	15.2	0.01317	0.0066	6.5
250	1.005	1.004	23	15.2	0.01317	0.0032	6.5
1440	1.004	1.003	23	15.5	0.01317	0.0014	4.9
2880	1.004	1.003	23	15.5	0.01317	0.0010	4.9



U.S. STANDARD SIEVE NUMBERS



	1.5
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Sample #	Classification	% Gravel	% Sand	% Silt	% Clay*	% Moist.	LL	PL	PΙ	Project:	CA HSR FRE_BAK
SS24	(SC) Clayey Sand	0	79.3	14.3	6.4	0.9					
										TES#:	23502-ZS9
										Boring#:	S0068R 111-111.5'
										Date:	11/12/2013

^{*} Particles smaller than 5 Micron in diameter



Construction Testing & Inspection * Geotechnical & Environmental Engineering

Sieve Analysis for Soil / Fine Aggregate ASTM C-136

Project:	CA HSR		Technician:	K. Ford				
	- <u>-</u> -		Date:	11/24/2013				
TES#:	23502-ZS9		Sample No.:	MC29-2				
Boring #:	S0068R; 135.5-13	36'	Classification:	(ML) Silt				
	,		-					
		Weight	Maximum	Minimum W	eight of			
		(lbs. or grams)	Sieve Size	Test Specime	n, lbs. (kg)			
Total Dry S	ample + Tare Wt.	-	Sand	1.0 (0	.5)			
Tare Weigh	nt		3/8"	2.0 (1	.0)			
Total Dry S	ample Wt.	159.7	1/2"	4.0 (2	.0)			
Initial Weig	ht Fine		3/4"	11.0 (5	11.0 (5.0)			
Aggregate	Before Wash	159.7	1"	22.0 (1	0.0)			
Final Weigh			1 1/2"	33.0 (1	5.0)			
Aggregate A	After Wash	9.7	2"	44.0 (2	0.0)			
	Cumulative	Individual	Cumulative	Cumulative				
Sieve	Weight	Weights	%	%				
Size	Retained	Retained	Retained	Passing	Specs.			
3 in.			0.0	100.0				
2 1/2 in.			0.0	100.0				
2 in.			0.0	100.0				
1 1/2 in.			0.0	100.0				
1 in.			0.0	100.0				
3/4 in.			0.0	100.0				

0.0

0.0

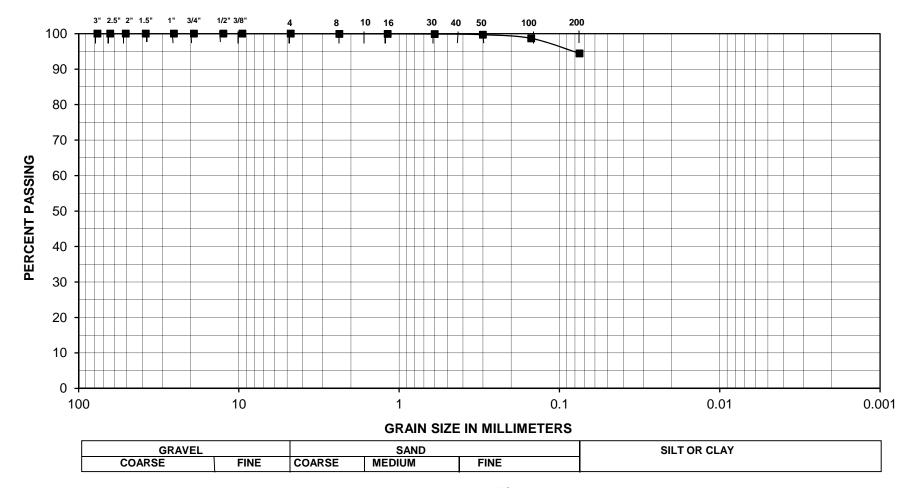
100.0

100.0

1/2 in.

3/8 in.

U.S. STANDARD SIEVE NUMBERS



—**■**— MC29-2

Sample #	Classification	% Gravel	% Sand	% Silt	% Clay	% Moist.	LL	PL	PI	Project:	CA HSR
MC29-2	(ML) Silt	0	5.6	94.4							
										TES#:	23502-ZS9
										Boring #	S0068R; 135.5-136'
										Date:	11/24/2013



Construction Testing & Inspection * Geotechnical & Environmental Engineering

Sieve Analysis for Soil and Fine Aggregate

 Project:
 CA HSR FRE_BAK
 Technician:
 K. Ford

 TES#:
 23502-ZS9
 Date:
 11/12/2013

 Boring No.:
 S0068R
 Depth, ft
 146-146.5

 Sample No.:
 MC31-1
 Classification:
 (ML) Sandy Clayey Silt

	Weight	Maximum	Minimum Weight of
	(grams)	Sieve Size	Test Specimen, lbs. (kg)
Total Dry Sample + Tare Wt.		Sand	1.0 (0.5)
Tare Weight		3/8"	2.0 (1.0)
Total Dry Sample Wt.	74.0	1/2"	4.0 (2.0)
Initial Weight Fine		3/4"	11.0 (5.0)
Soil Before Wash	74.0	1"	22.0 (10.0)
Final Weight Fine		1 1/2"	33.0 (15.0)
Soil After Wash	29.8	2"	44.0 (20.0)

	Individual	Individual	Combined	Combined	
Sieve	Weight	%	%	%	
Size	Retained	Retained	Retained	Passing	Specs.
3 in.	0.0	0.0	0.0	100.0	
2 1/2 in.	0.0	0.0	0.0	100.0	
2 in.	0.0	0.0	0.0	100.0	
1 1/2 in.	0.0	0.0	0.0	100.0	
1 in.	0.0	0.0	0.0	100.0	
3/4 in.	0.0	0.0	0.0	100.0	
1/2 in.	0.0	0.0	0.0	100.0	
3/8 in.	0.0	0.0	0.0	100.0	
#4	0.0	0.0	0.0	100.0	
#8	0.7	0.9	0.9	99.1	
#10	0.3	0.4	1.4	98.6	
#16	0.2	0.3	1.6	95.8	
#30	3.3	4.5	6.1	94.0	
#40	0.9	1.2	7.3	92.8	
#50	1.8	2.4	9.7	90.4	
#100	8.0	10.8	20.5	79.7	
#200	14.5	19.6	40.2	60.4	
Pan					

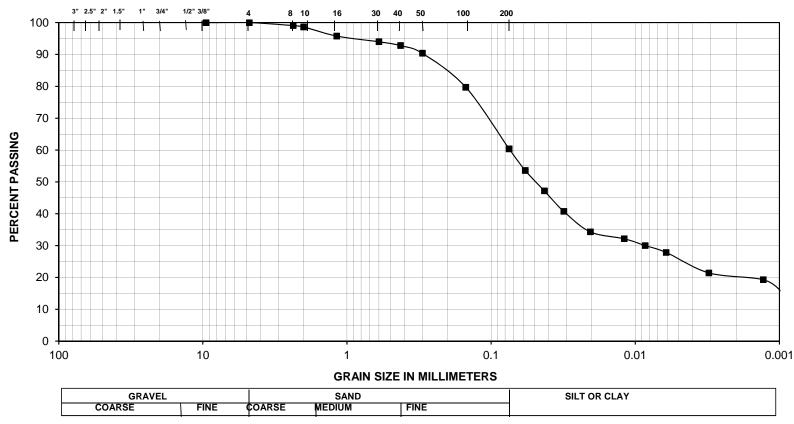


HYDROMETER TEST DATA SUMMARY ASTM D 422-63

PROJECT:		CA HSR F	RE_BAK			TES # : \$	S0068R
Boring Number		S006	68R	_		DATE: ⁷	11/12/2013
Sample Depth	, ft	146-1	46.5	Sample No.:	MC31-1	TESTED BY: K. Ford	
Mass of Test S	Sample d		75.00	"air-dried"	ר	Hydrometer Type	151H
	scopic Sample, g		9.43	"air-dried"	-	Trydrometer Type_	10111
	scopic Sample, g		9.30	"oven-dried"	Specific Gravity	of Test Material	2.650
Mass of Test			73.97	"oven-dried"	Specific Gravity		Varies
	· •				• • • • • • • • • • • • • • • • • • • •		
Time	Hydrometer	Corrected	Temperature	Effective Depth	Constant, K	Diameter, D	Amt. Suspended, P
(min.)	Reading	Reading	Degrees C	Table 2 (cm)	Table 3	(mm)	(%)
0.5	1.026	1.025	23	9.7	0.01317	0.0580	54.3
1	1.023	1.022	23	10.5	0.01317	0.0427	47.8
2	1.020	1.019	23	11.3	0.01317	0.0313	41.3
5	1.017	1.016	23	12.1	0.01317	0.0205	34.8
15	1.016	1.015	23	12.3	0.01317	0.0119	32.6
30	1.015	1.014	23	12.6	0.01317	0.0085	30.4
60	1.014	1.013	23	12.9	0.01317	0.0061	28.2
250	1.011	1.010	23	13.7	0.01317	0.0031	21.7
1440	1.010	1.009	23	13.9	0.01317	0.0013	19.6
2880	1.008	1.007	23	14.4	0.01317	0.0009	15.2
	1				1		



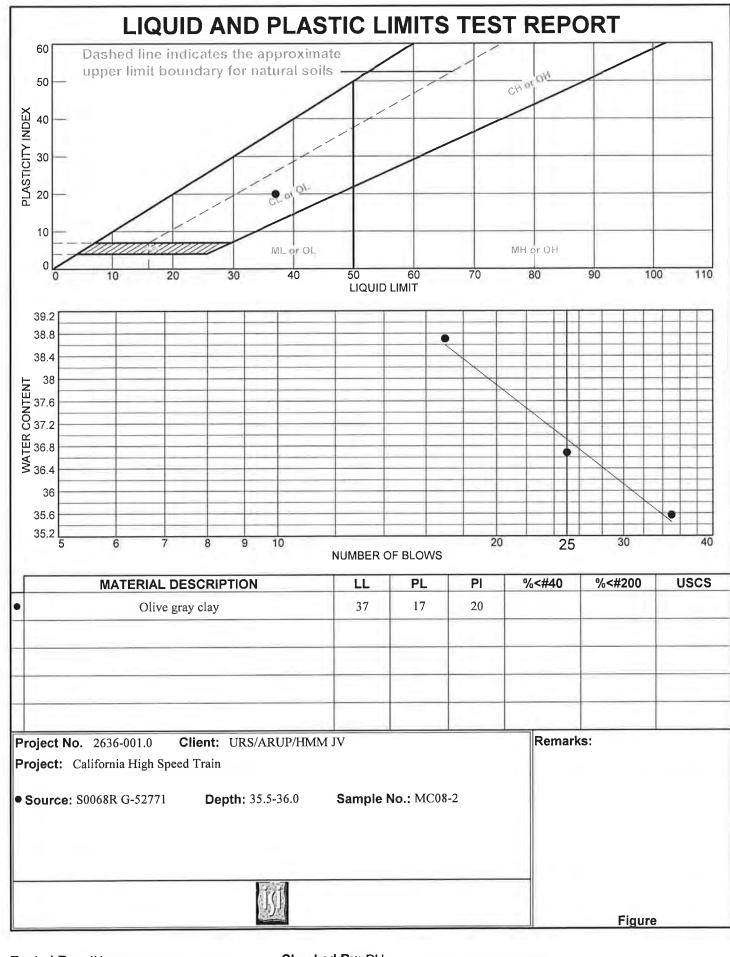
U.S. STANDARD SIEVE NUMBERS



146-146.5

Sample #	Classification	% Gravel	% Sand	% Silt	% Clay*	% Moist.	L	PL	P	Project:	CA HSR FRE_BAK
MC31-1	(ML) Sandy Clayey Silt	0	40.2	32.3	27.5	1.4					
										TES#:	23502-ZS9
										Boring#:	S0068R 146-146.5'
										Date:	11/12/2013

^{*} Particles smaller than 5 Micron in diameter



Tested By: JH Checked By: PH



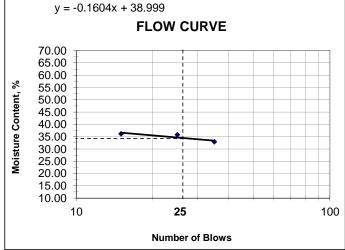
Project Name:	HSR	Boring No	o.: S0068R			Project No.: 23502-ZS9	
Sample No:	SS13	Depth:	61-61.5'	Date:	11/25/13	Tested By: K.F	
Soil Classification:	ML						

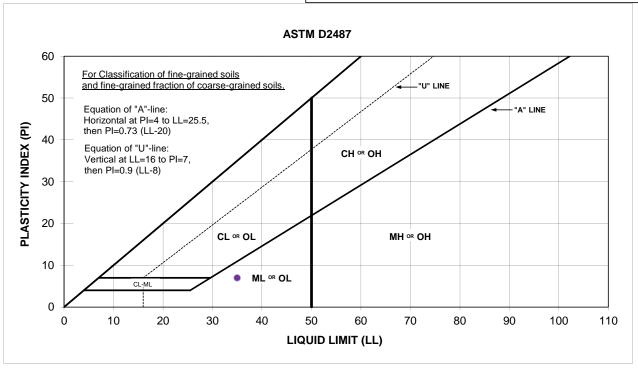
		PLASTIC LIMIT			LIQUID LIMIT					
A Tes No.	1	2	3	No. of Blows	35	25	15			
B Tare No.	1	2	3		1	2	3			
C Mass of Pan + Dry Soil, g	28.77	29.40	29.60		29.29	29.62	23.19			
D Mass of Pan + Wet Soil, g	28.90	29.70	29.91		29.60	29.91	24.12			
E Mass of Pan, g	28.20	28.40	28.61		28.35	28.81	20.62			
F Mass of Water, g	0.13	0.30	0.31	0.00	0.31	0.29	0.93			
G Mass of Dry Soil, g	0.57	1.00	0.99		0.94	0.81	2.57			
H Moisture Content, %	22.81	30.00	31.31		32.98	35.80	36.19			

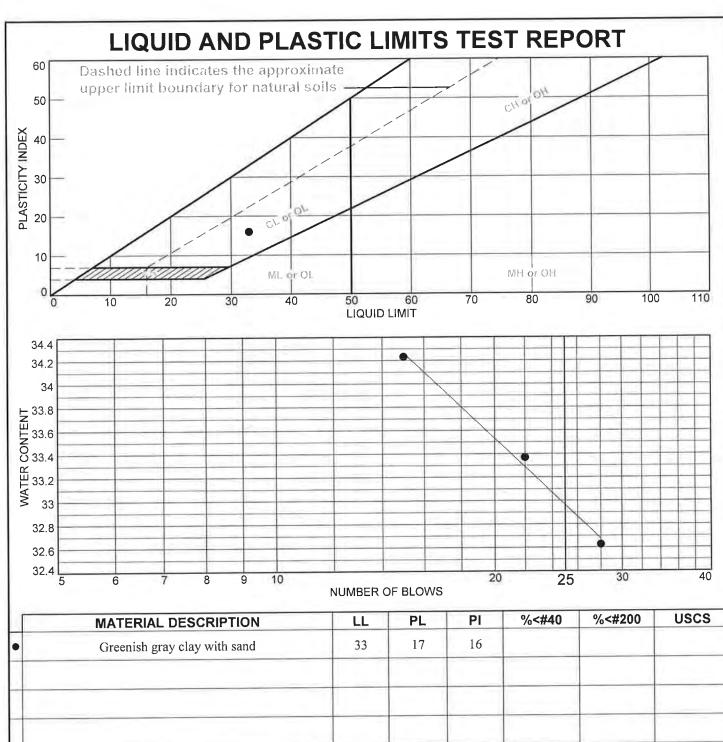
I Average Moisture Content, % (PL)

42.1795

Liquid Limit:	35.0
Plastic Limit: Line I	28.0
Plasticity Index: Pl = LL - PL	6.9







	MATERIAL DESCRIPTION	LL	PL	PI	%<#4U	70<#ZUU	0303	
•	Greenish gray clay with sand	33	17	16				
					1 7			

Project No. 2636-001.0 Client: URS/ARUP/HMM JV

Project: California High Speed Train

• Source: S0068R G-52771

Depth: 67.0-69.0

Sample No.: U15

Remarks:



Figure



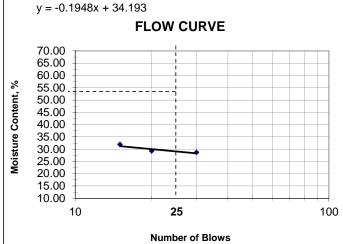
Project Name:	HSR	Boring No	o.: S0068R			Project No.: 23502-ZS9	
Sample No:	SS16	Depth:	71-71.5'	Date:	11/25/13	Tested By: K.F	
Soil Classification:	CL						

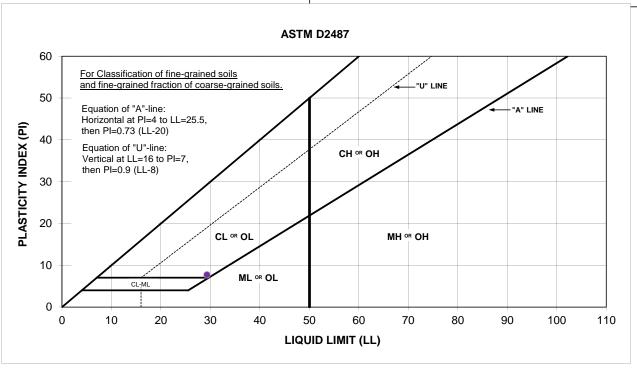
	PLASTIC LIMIT			LIQUID LIMIT					
1	2	3	No. of Blows	15	20	30			
1	2	3		1	2	3			
29.27	29.31	29.62		31.28	31.02	30.84			
29.41	29.53	29.91		32.20	31.84	31.56			
28.51	28.23	28.51		28.40	28.22	28.33			
0.14	0.22	0.29	0.00	0.92	0.82	0.72			
0.76	1.08	1.11		2.88	2.80	2.51			
18.42	20.37	26.13		31.94	29.29	28.69			
	1 1 29.27 29.41 28.51 0.14 0.76	1 2 1 2 29.27 29.31 29.41 29.53 28.51 28.23 0.14 0.22 0.76 1.08	1 2 3 1 2 3 29.27 29.31 29.62 29.41 29.53 29.91 28.51 28.23 28.51 0.14 0.22 0.29 0.76 1.08 1.11	1 2 3 No. of Blows 1 2 3 29.27 29.31 29.62 29.41 29.53 29.91 28.51 28.23 28.51 0.14 0.22 0.29 0.00 0.76 1.08 1.11	1 2 3 No. of Blows 15 1 2 3 1 29.27 29.31 29.62 31.28 29.41 29.53 29.91 32.20 28.51 28.23 28.51 28.40 0.14 0.22 0.29 0.00 0.92 0.76 1.08 1.11 2.88	1 2 3 No. of Blows 15 20 1 2 3 1 2 29.27 29.31 29.62 31.28 31.02 29.41 29.53 29.91 32.20 31.84 28.51 28.23 28.51 28.40 28.22 0.14 0.22 0.29 0.00 0.92 0.82 0.76 1.08 1.11 2.88 2.80	1 2 3 No. of Blows 15 20 30 1 2 3 1 2 3 29.27 29.31 29.62 31.28 31.02 30.84 29.41 29.53 29.91 32.20 31.84 31.56 28.51 28.23 28.51 28.40 28.22 28.33 0.14 0.22 0.29 0.00 0.92 0.82 0.72 0.76 1.08 1.11 2.88 2.80 2.51		

I Average Moisture Content, % (PL)

42.1795

Liquid Limit:	29.3
Plastic Limit: Line I	21.6
Plasticity Index: Pl = LL - PL	7.7





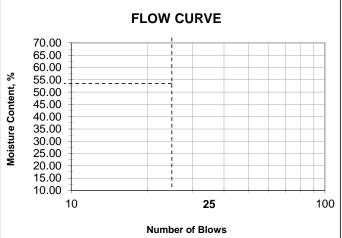


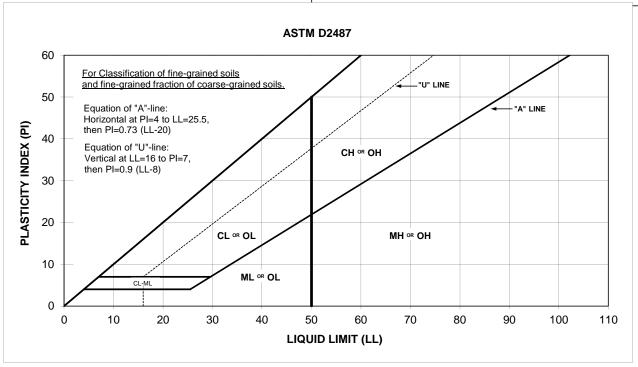
Project Name:	HSR	Boring No	Boring No.: S0068R			Project No.: 23502-ZS9
Sample No:	MC23-1	Depth:	105.5-106' D	Date:	11/25/13	Tested By: K.F
Soil Classification:	SP				•	

-	PLASTIC LIMIT				LIQUIE	LIMIT	
1	2	3	No. of Blows				
1	2	3		1	2	3	
	1	1 2	1 2 3	1 2 3 No. of Blows			

I Average Moisture Content, % (PL)

Liquid Limit:	NONPLASTIC
Plastic Limit: Line I	
Plasticity Index: Pl = LL - PL	







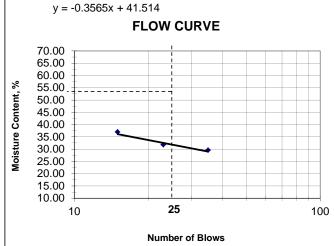
Project Name:	HSR	Boring No	o.: S0068R		Project No.: 23502-ZS9	
Sample No:	SS30	Depth:	135.5-136' Date:	11/25/13	Tested By: K.F	
Soil Classification:	ML					

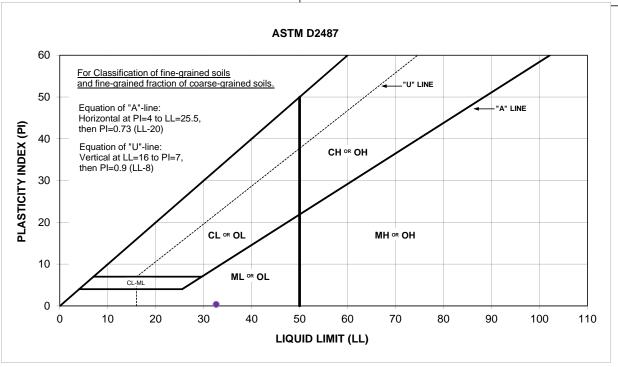
PLASTIC LIMIT					LIQUIE	LIMIT		
A Tes No.	1	2	3	No. of Blows	35	23	15	
B Tare No.	1	2	3		1	2	3	
C Mass of Pan + Dry Soil, g	21.31	20.94	21.31		21.78	23.69	30.08	
D Mass of Pan + Wet Soil, g	21.51	21.03	21.54		22.10	24.68	30.81	
E Mass of Pan, g	20.71	20.63	20.64		20.70	20.58	28.11	
F Mass of Water, g	0.20	0.09	0.23	0.00	0.32	0.99	0.73	
G Mass of Dry Soil, g	0.60	0.31	0.67		1.08	3.11	1.97	
H Moisture Content, %	33.33	29.03	34.33		29.63	31.83	37.06	
· ·								

I Average Moisture Content, % (PL)

42.1795

Liquid Limit:	32.6
Plastic Limit: Line I	32.2
Plasticity Index: Pl = LL - PL	0.4





UNCONSOLIDATED UNDRAINED COMPRESSION TEST - ASTM D2850

Client: URS/ARUP/HMM JV

Project: California High Speed Train

Job #: 2636-001.0 **Data Reduction:**

Boring # S0068R Sample #: MC08-1 Dial factor = in/unit 1.0 Depth (ft): 36 Load factor = 1.0 lb/unit

Date tested: 11/22/13

Soil: Grayish brown clay

Specimen:	Total wt. =	868.2	gms
	Ht. =	5.780	in
	Ave dia. =	2.423	in

4.614 sq.in Area = Volume = 437.0 c.c. Shearing rate = 0.04 inch/min Shearing rate = 0.75 %/min Gs (assumed) = 2.70

Test Report:	Void ratio=	0.719	
	Ht/Dia ratio =	2.39	
	Moisture =	26.5	%
	Total density=	124.0	pcf

Dry density = 98.0 Saturation = 99.4 Chamber pressure = 5760 psf Max. deviator stress= 5190 psf Strain @ failure = 14.61

-0.002		0.00	0.0
	12.0		0.0 433.5
0.003	13.9	0.08	
0.006	13.9	0.13	433.3
0.008	13.9	0.17	433.1
0.011	21.1	0.22	657.3
0.014	22.6	0.27	704.5
0.017	24.0	0.32	747.0
0.020	25.1	0.38	781.5
0.023	26.2	0.43	814.9
0.026	26.2	0.48	814.5
0.029	28.1	0.53	873.1
0.032	29.0	0.58	900.1
0.035	29.6	0.63	919.4
0.037	30.3	0.68	940.4
0.040	31.2	0.73	967.0
0.043	31.9	0.78	989.2
0.047	32.5	0.83	1006.7
0.049	33.8	0.88	1044.4
0.052	34.1	0.93	1053.6
0.055	34.9	0.98	1078.1
0.058	35.3	1.04	1091.4
0.070	38.6	1.24	1190.7
0.081	41.6	1.44	1279.0
0.093	44.7	1.64	1371.9
0.105	47.5	1.85	1454.3
0.116	51.1	2.04	1561.0
0.128	54.5	2.24	1662.4
0.140	57.9	2.45	1763.7
0.152	61.2	2.65	1858.4
0.163	64.6	2.85	1959.4
0.175	68.8	3.05	2080.8
0.186	71.4	3.25	2156.5
0.198	75.1	3.46	2263.5
0.210	78.6	3.66	2363.7
0.222	81.8	3.86	2455.3
0.250	91.0	4.36	2714.9
0.280	99.1	4.87	2942.7
0.335	113.4	5.83	3331.9
0.408	132.0	7.08	3828.2
0.480	148.8	8.33	4257.5
0.552	164.3	9.59	4635.4
0.625	175.2	10.84	4873.7
0.698	183.2	12.10	5024.8
0.090	189.5	13.36	5123.6
0.770	194.8	14.61	5123.6
0.043	194.0	15.86	5190.2
0.915			4957.0
	191.3	16.98	
1.046	180.1	18.12	4602.5
1.118	161.8	19.38	4072.1

Axial

Strain

(%)

Dial

Load

Read. Read.

Deviator

Stress

(psf)









UNCONSOLIDATED UNDRAINED COMPRESSION TEST - ASTM D2850

Client: URS/ARUP/HMM JV

Project: California High Speed Train

Job #: 2636-001.0 **Data Reduction:** Boring # S0068R

Sample #: U15 Dial factor = 1.0 in/unit Depth (ft): 67 Load factor = 1.0 lb/unit

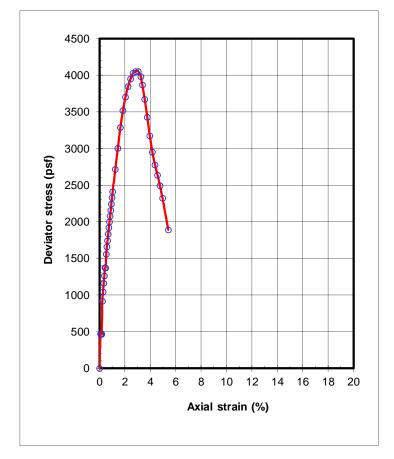
Date tested: 11/28/13

Soil: Greenish gray clay with sand

Specimen:	Total wt. =	1343.2	gms
	Ht. =	6.050	in
	Ave dia. =	2.880	in
	Area =	6.517	sq.in
	Volume =	646.1	C.C.

Shearing rate = 0.03 inch/min Shearing rate = 0.5 %/min Gs (assumed) = 2.70

Test Report:	Void ratio=	0.566	
	Ht/Dia ratio =	2.10	
	Moisture =	20.5	%
	Total density=	129.7	pcf
	Dry density =	107.6	pcf
	Saturation =	98.1	%
	Chamber pressure=	10800	psf
	Max. deviator stress=	4054	psf
	Strain @ failure=	2.85	%



Diai	Load	Otrairi	Otross
Read.	Read.	(%)	(psf)
-0.002		0.00	0.0
0.003	21.2	0.07	467.1
0.006	21.2	0.13	466.9
0.009	21.2	0.18	466.6
0.012	41.6	0.22	917.3
0.015	47.3	0.28	1042.8
0.018	52.8	0.33	1163.9
0.021	57.4	0.38	1264.0
0.024	62.4	0.43	1373.9
0.028	62.4	0.48	1373.1
0.031	70.9	0.53	1557.6
0.034	75.5	0.58	1657.7
0.037	79.4	0.64	1742.9
0.040	83.5	0.69	1833.4
0.043	87.6	0.74	1920.5
0.046	91.2	0.79	2000.4
0.049	94.9	0.83	2079.5
0.052	98.5	0.89	2156.2
0.055	102.6	0.94	2246.4
0.058	106.5	0.99	2329.9
0.061	110.3	1.04	2412.1
0.073	124.4	1.24	2714.9
0.086	137.9	1.44	3004.3
0.098	151.2	1.64	3286.5
0.110	162.2	1.84	3518.7
0.122	171.2	2.04	3704.5
0.134	178.2	2.24	3848.7
0.146	183.4	2.44	3953.5
0.158	187.3	2.65	4029.0
0.171	188.9	2.85	4054.1
0.183	189.2	3.05	4052.8
0.195	186.3	3.25	3982.0
0.202	181.2	3.37	3868.3
0.213	172.4	3.55	3673.9
0.225	161.2	3.75	3428.0
0.238	149.6	3.95	3175.8
0.250	139.3	4.15	2950.6
0.262	131.5	4.35	2779.6
0.274	125.2	4.55	2639.7
0.286	118.4	4.76	2491.7
0.298	110.6	4.96	2322.3
0.326	90.5	5.41	1891.3

Axial

Strain

Dial

Load

Deviator

Stress









UNCONSOLIDATED UNDRAINED COMPRESSION TEST - ASTM D2850

Client: URS/ARUP/HMM JV

Project: California High Speed Train

Job # : 2636-001.0 Data Reduction:

 Boring # S0068R

 Sample # : MC19-1
 Dial factor = 1.0 in/unit

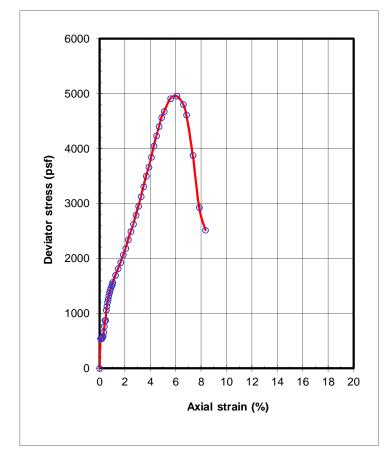
 Depth (ft) : 86.0-86.5
 Load factor = 1.0 lb/unit

Date tested: 11/23/13

Soil: Greenish gray sandy clay

Specimer	i: Total wt. =	905.2	gms	
	Ht. =	5.820	in	
	Ave dia. =	2.420	in	
	Area =	4.601	sq.in	
	Volume =	438.9	C.C.	
	Shearing rate =	0.04	inch/min	
	Shearing rate =	0.75	%/min	
	Gs (assumed) =	2.70		

Test Report:	Void ratio =	0.567	
	Ht/Dia ratio =	2.40	
	Moisture =	19.7	%
	Total density=	128.7	pcf
	Dry density =	107.5	pcf
	Saturation =	93.8	%
	Chamber pressure=	12240	psf
	Max. deviator stress=	4954	psf
	Strain @ failure=	6.08	%



0.008	17.4	0.17	542.7
0.011	17.9	0.22	558.6
0.015	18.7	0.28	583.6
0.017	21.2	0.33	659.8
0.020	24.5	0.38	764.0
0.023	28.1	0.43	875.4
0.026	28.1	0.49	874.9
0.029	34.0	0.53	1058.0
0.032	36.4	0.58	1131.2
0.035	38.8	0.63	1206.1
0.038	40.4	0.68	1256.8
0.041	42.5	0.74	1320.5
0.044	44.2	0.79	1373.7
0.047	45.7	0.84	1418.4
0.050	47.0	0.89	1458.1
0.053	48.5	0.94	1504.9
0.056	49.4	0.99	1529.3
0.059	50.6	1.04	1568.3
0.071	54.8	1.25	1693.0
0.083	58.8	1.45	1814.0
0.094	62.7	1.65	1929.3
0.106	67.2	1.86	2064.6
0.118	71.3	2.06	2185.9
0.129	76.5	2.25	2338.7
0.141	81.6	2.46	2489.5
0.153	86.2	2.66	2626.7
0.164	91.8	2.86	2791.1
0.176	97.4	3.06	2954.8
0.188	103.3	3.27	3127.1
0.200	109.6	3.46	3310.0
0.212	116.1	3.67	3499.9
0.223	121.7	3.87	3660.6
0.235	128.1	4.07	3844.4
0.247	135.1	4.27	4047.7
0.259	141.6	4.47	4231.7
0.270	147.5	4.68	4400.5
0.282	153.3	4.87	4563.8
0.294	157.4	5.08	4674.5
0.323	166.2	5.58	4910.0
0.352	168.5	6.08	4953.6
0.381	164.4	6.58	4806.6
0.396	158.1	6.84	4610.2
0.425	133.6	7.34	3875.2
0.454	101.6	7.84	2930.6
0.483	87.8	8.34	2517.6

Axial

Strain

(%)

0.00

0.08

0.12

0.17

Dial

-0.002

0.003

0.005

0.008

Read.

Load

Read.

17.4

17.4

17.4

Deviator

Stress

(psf)

0.0

543.2

542.9

542.7









Direct Shear Moisture and Density Laboratory Results

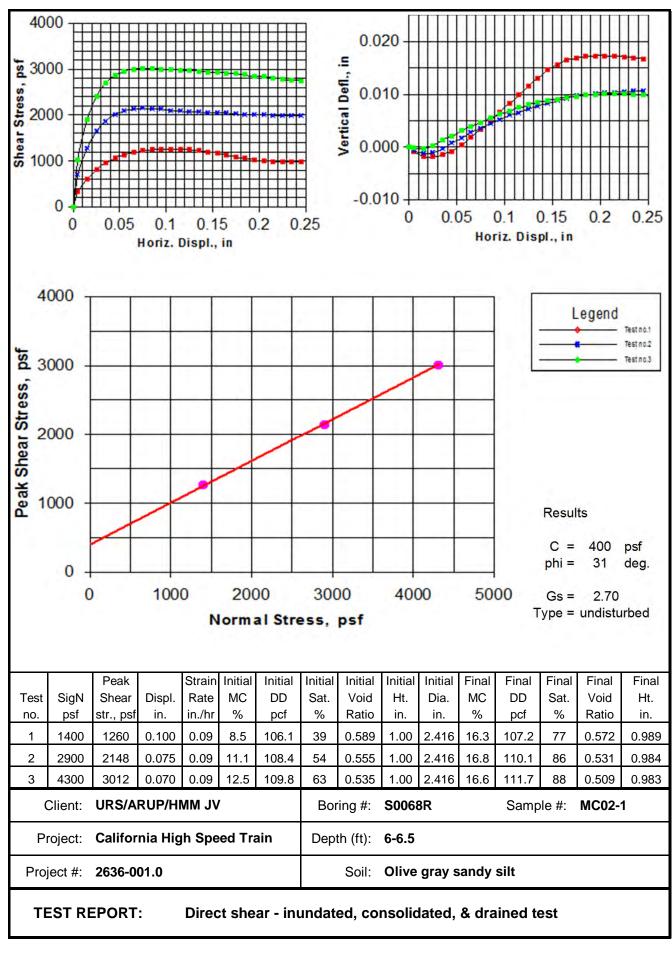
wet density (pcf) = 124.1

dry density (pcf) = 110.9

moisture (%) = 11.9

Client:	URS/ARUP/HMM JV	Boring #:	S0068R	Sample #:	MC02-1
Project:	California High Speed Train	Depth (ft):	6-6.5		
Project #:	2636-001.0	Soil:	Olive gray sandy s	silt	

TEST REPORT: Direct shear - inundated, consolidated, & drained test



Direct Shear Moisture and Density Laboratory Results

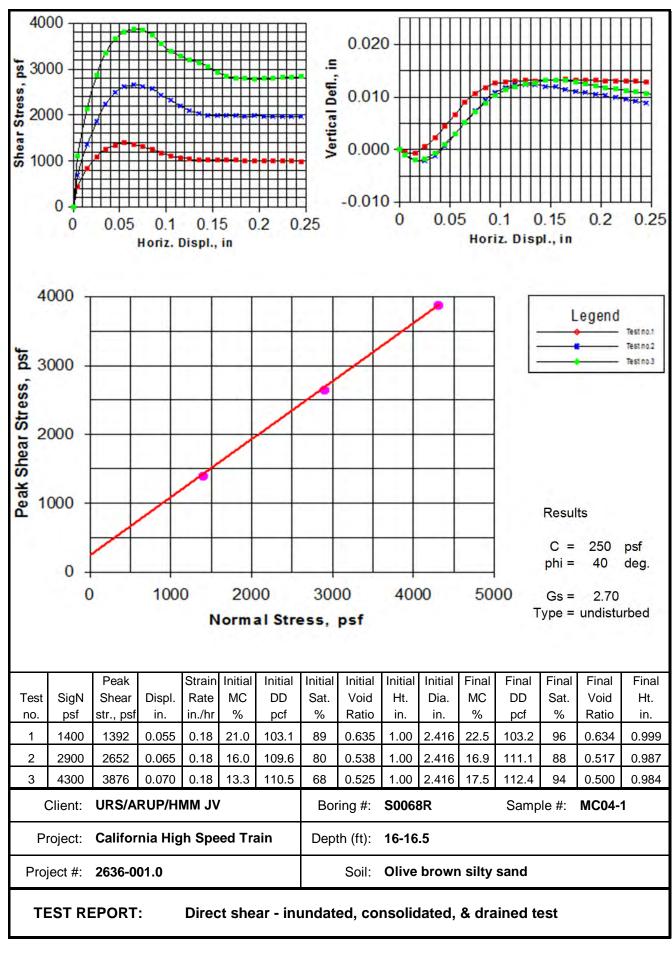
wet density (pcf) = 130.4

dry density (pcf) = 112.7

moisture (%) = 15.7

Client:	URS/ARUP/HMM JV	Boring #:	S0068R	Sample #:	MC04-1
Project:	California High Speed Train	Depth (ft):	16-16.5		
Project #:	2636-001.0	Soil:	Olive brown silty s	sand	

TEST REPORT: Direct shear - inundated, consolidated, & drained test



Direct Shear Moisture and Density Laboratory Results

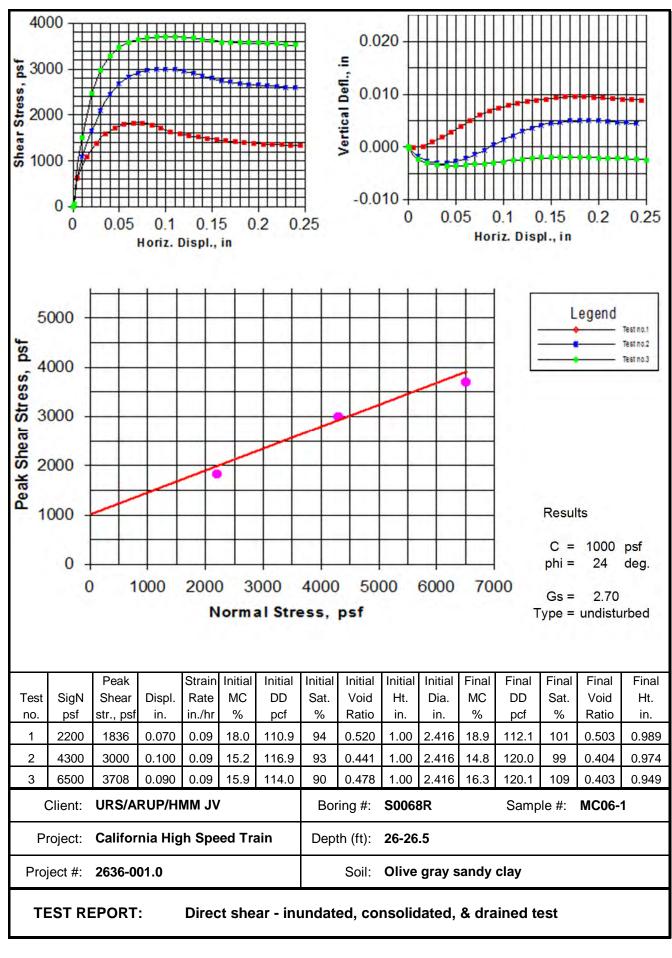
wet density (pcf) = 135.9

dry density (pcf) = 118.7

moisture (%) = 14.5

Client:	URS/ARUP/HMM JV	Boring #:	S0068R	Sample #:	MC06-1
Project:	California High Speed Train	Depth (ft):	26-26.5		
Project #:	2636-001.0	Soil:	Olive gray sandy	clay	

TEST REPORT: Direct shear - inundated, consolidated, & drained test



CONSOLIDATION TEST DATA

Client Name: URS/ARUP/HMM JV

Project Name: CAHST
Project Number: 2636-001.0

Boring No: S0068R

Sample No: <u>U15</u> Depth (ft): <u>67-69</u>

Soil: Greenish gray clay with sand

Sample type: Undisturbed

Inundation at end of _____ psf

Test started: 11/27/2013
Test finished: 12/4/2013
Equip. #: 1346

Moisture & Density Data

molecule a perior para			
	Test speci	men	M&D check
	Before	After	as received
Specimen height (in.)	1.00	0.903	4.25
Wt. of specimen + tare (gm)	195.5	190.2	919.2
Tare wt. (gm)	45.1	45.1	0.0
Diameter (in.)	2.420	2.420	2.880
Wet wt. of soil + dish wt. (gm)	195.5	190.2	195.6
Dry wt. of soil + dish wt. (gm)	167.3	167.3	172.2
Wt. of dish (gm)	45.1	45.1	50.6
Wet Density (pcf)	124.55	133.13	126.48
Dry Density (pcf)	101.18	112.06	106.06
Moisture Content (%)	23.1	18.8	19.3
Gs (assumed)	2.70		
е	0.667	0.505	0.590
S(%)	93.6	100.6	88.1
Vt (c.c.)	75.40	68.08	453.88
Vs (c.c.)	45.24	45.24	285.48
Vv (c.c.)	30.16	22.84	168.39

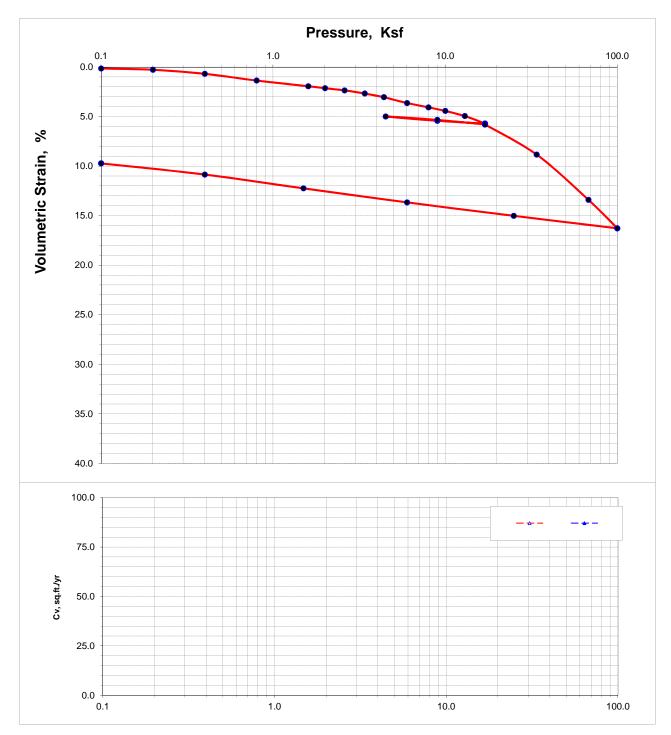
Volumetric Strain & Void Ratio Computation

void Ratio Computation				
Load	Dial	Ev	Void	
(Ksf)	Rds.	(%)	Ratio	
0.1	1			
0.1	0.9986	0.14	0.6643	
0.2	0.9973	0.27	0.6621	
0.4	0.9932	0.68	0.6553	
8.0	0.9865	1.35	0.6441	
1.6	0.9808	1.92	0.6346	
2	0.9788	2.12	0.6313	
2.6	0.9765	2.35	0.6274	
3.4	0.9733	2.67	0.6221	
4.4	0.9696	3.04	0.6159	
6	0.9637	3.63	0.6061	
8	0.9594	4.06	0.5989	
10	0.9558	4.42	0.5929	
13	0.9506	4.94	0.5843	
17	0.943	5.70	0.5716	
17	0.943	5.70	0.5716	
9	0.9459	5.41	0.5764	
4.5	0.9502	4.98	0.5836	
9	0.9467	5.33	0.5778	
17	0.9421	5.79	0.5701	
17	0.9421	5.79	0.5701	
34	0.9118	8.82	0.5196	
68	0.8662	13.38	0.4436	
100	0.8374	16.26	0.3956	
100	0.8374	16.26	0.3956	
25	0.8499	15.01	0.4164	
6	0.8636	13.64	0.4393	
1.5	0.8778	12.22	0.4629	
0.4	0.8778	12.23	0.4629	
0.1	0.9029	9.71	0.5048	
0.1	0.9029	9.71	0.5048	

Area=	4.601	sq in	_
	0.14	0.14	
POINTS	0.27	0.27	LINE
	0.68	0.68	
	1.36	1.36	
	1.93	1.93	
	2.13	2.13	
	2.35	2.35	
	2.67	2.67	
	3.04	3.04	
	3.63	3.63	
	4.06	4.06	
	4.43	4.43	
	4.94	4.94	
	5.70	5.70	
	5.70	5.70	
	5.42	5.42	
	4.98	4.98	
	5.33	5.33	
	5.79	5.79	
	5.79	5.79	
	8.83	8.83	
	13.39	13.39	
	16.26	16.26	
	16.26	16.26	
	15.01	15.01	
	13.65	13.65	
	12.23	12.23	
	10.84	10.84	
	9.72	9.72	
	9.72	9.72	

CONSOLIDATION TEST

	Boring Number S		S0068R	Sample Number		U15	Depth (ft) 67-69			
	Soil	Soil Description Greenish gray clay with sand								
		Water Content, %	Total Unit Weight, pcf	Void Ratio	Saturation %	Height in	Diameter in	Specific Gravity	Liquid Limit, %	Plasticity Index, %
Ī	Initial	23.1	124.5	0.667	93.6	1.00		(assumed)		
	Final	18.8	133.1	0.505	100.6	0.903	2.420	2.70	33	16





R - VALUE TEST ASTM D - 2844 / CAL 301

Project Number : 23502-ZS9

Project Name : CA HSR FRE_BAK

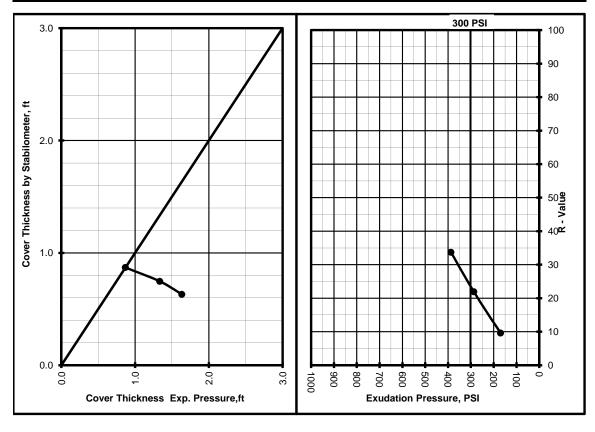
Date : 11/21/13

Sample Location/Curve Number : Boring S0068R,B-1 @ 0-5'

Soil Classification : SM

TEST	А	В	С
Percent Moisture @ Compaction, %	12.0	13.0	14.0
Dry Density, Ibm/cu.ft.	120.0	118.8	116.1
Exudation Pressure, psi	387	287	170
Expansion Pressure, (Dial Reading)	0.0049	0.004	0.0026
Expansion Pressure, psf	0.021217	0.01732	0.011258
Resistance Value R	34	22	10

R Value by Expansion Pressure (TI =): 5	(9)	
R Value at 300 PSI Exudation Pressure	24	





ASTM D - 1557

Project Number : 23502-ZS9

: CA HSR FRE_BAK **Project Name**

Date : 11/8/2013 Sample location : S0068R Sample/Curve Number : B01 0'-5'

Soil Classification : (SM) Silty Sand

Test Method : 1557A

	1	2	3	4
Weight of Moist Specimen & Mold, gm	3892.1	3958.4	3995.7	3944.0
Weight of Compaction Mold, gm	1958.5	1958.5	1958.5	1958.5
Weight of Moist Specimen, gm	1933.6	1999.9	2037.2	1985.5
Volume of mold, cu. ft.	0.0333	0.0333	0.0333	0.0333
Wet Density, Ibs/cu.ft.	128.0	132.4	134.9	131.4
Weight of Wet (Moisture) Sample, gm	300.0	300.0	300.0	300.0
Weight of Dry (Moisture)Sample, gm	276.2	271.0	266.5	261.8
Moisture Content, %	8.6	10.7	12.6	14.6
Dry Density, lbs/cu.ft.	117.9	119.6	119.8	114.7

